CHAPTER 5. Geographic Differences of Service Utilization

Introduction

Utilization measures such as average payments, work RVUs, and number of services per recipient differ not only according to payer, but by geographic factors. ***This chapter examines the trends within and between five Maryland regions represented by: (1) the National Capital Area, (2) the Baltimore Metro Area, (3) Western Maryland, (4) Southern Maryland, and (5) the Eastern Shore.*** Two major portions of the analysis form this chapter. The first section explores the extent to which residents of Maryland go out-of-state for care, what services they are receiving from out-of-state providers, and what counties they reside in. The second analysis examines the use of services by region using the same utilization variables as in Chapters 2, 3, and 4. The utilization comparisons are described in three sections: (1) service intensity per recipient (2) type of service and (3) practitioner specialty.

The sources and limitations of the analyses data are discussed in Chapter 1. The data set used here was also used in Chapters 2, 3, and 4, and does not include dental services or HMO capitated services. Additionally, the information contained in the service category tables differs slightly from that reported in the specialty tables. This is because the service category analysis excluded data with payer-specific "homegrown" service codes.

Out-Of-State Service Use By Residents

Out-of-State Spending by Service and Payer

In some parts of the state, out-of-state practitioners provide a substantial share of services. To examine variations in out-of-state use, the Commission compared the servicing practitioner's county to the recipient's county of residence with county determined from the servicing practitioner's and the recipient's ZIP codes.[1] Table 20 examines inter-state patterns using the proportion of total payments and total work RVUs[2] that are corrected for by practitioners operating within Maryland. It presents these proportions for each BETOS service category by payer.[3] Within each service category, a higher percentage represents a greater share of services delivered by in-state practitioners.

[1] Although this ZIP code often reflects practice location, it sometimes defines where the practitioner's payment was sent. Consequently, some caution must be used in interpreting the results of the analyses that rely on ZIP code to determine location.
[2] Refer to the text box in Chapter 2 for a discussion of Work RVUs.
[3] Refer to Chapter 3 for a discussion of the BETOS.

TABLE 20
PERCENT OF TOTAL PAYMENT AND WORK RVUs TO IN-STATE PROVIDERS BY SERVICE CATEGORY AND PAYER - 1998

Service Category	Private Non-HMO		Private HMO FFS		Medicare Non-HMO		Medicare HMO FFS	
	Paym.	Work RVUs	Paym.	Work RVUs	Paym.	Work RVUs	Paym.	Work RVUs
In-State Total	**%86.0**	**%87.5**	**%84.1**	**%85.4**	**%89.5**	**%89.6**	**%91.3**	**%90.2**
Total E&M	**87.5**	**89.0**	**85.5**	**86.5**	**90.7**	**91.1**	**92.5**	**92.7**
Office Visits – Established	91.2	92.2	91.5	91.6	92.5	92.6	97.9	98.0
Hospital Visit – Initial	89.2	89.9	79.1	82.7	91.6	91.7	91.5	94.2
Nursing Home Visit	94.7	94.9	94.0	94.9	93.1	93.2	97.0	96.9
Hospital Visit – Critical Care	77.7	79.6	74.1	75.1	86.1	86.5	89.7	89.9
Emergency Room Visit	67.6	65.7	62.0	63.9	91.6	91.7	72.2	70.6
Home Visit	38.2	40.2	90.0	90.1	93.8	93.8	93.0	92.8
Total Procedures	**87.6**	**88.4**	**85.1**	**86.4**	**88.5**	**89.5**	**93.4**	**92.2**
Endoscopy – Laparoscopic Cholecystectomy	90.9	92.4	89.7	90.9	93.2	94.2	98.6	97.8
Major Procedure, Cardiovascular – Thromboendarterectomy	93.7	94.1	96.9	96.8	91.2	92.7	95.1	96.3
Major Procedure, Orthopedic – Hip Fracture Repair	89.7	91.0	84.5	84.5	92.6	92.9	94.5	90.8
Major Procedure, Orthopedic – Hip Replacement	88.5	87.6	83.1	82.3	89.8	91.2	99.1	97.6
Major Procedure, Orthopedic – Knee Replacement	90.8	90.2	91.1	92.3	92.0	93.0	96.9	92.9
Major Procedure, Cardiovascular – CABG	78.0	80.9	73.5	75.4	64.4	69.2	90.7	82.6
Major Procedure, Cardiovascular – Coronary Angioplasty	87.1	86.7	81.3	78.8	78.7	79.1	93.8	92.7
Major Procedure, Cardiovascular – Pacemaker Insertion	79.9	79.9	79.1	78.1	84.3	84.8	92.1	87.4
Eye Procedure – Corneal Transplant	49.1	76.7	87.9	87.9	92.4	94.1	96.8	94.8
Oncology – Radiation Therapy	74.4	76.2	71.4	70.2	91.9	91.3	86.9	85.4
Total Imaging	**84.8**	**87.0**	**84.1**	**83.6**	**91.6**	**91.0**	**93.4**	**92.6**
Standard Imaging – Musculoskeletal	89.5	91.1	87.5	86.7	93.0	92.2	94.7	94.0
Echography – Prostate, Transrectal	87.2	89.5	91.8	92.5	91.6	91.6	98.7	98.7
Advanced Imaging – MRI: Brain	81.8	83.2	76.3	74.2	94.3	91.6	92.2	89.2
Advanced Imaging – MRI: Other	83.0	84.7	81.0	80.0	93.9	92.4	91.5	90.9
Imaging/Procedure – Heart, including Cardiac Catheter	84.9	87.5	82.2	80.7	82.6	83.4	91.3	91.8
Total Tests	**77.0**	**77.1**	**82.0**	**75.1**	**81.7**	**78.6**	**82.1**	**56.1**
Other Tests – Electrocardiograms	87.1	88.8	85.0	84.4	91.2	90.9	92.2	90.5
Other Tests – Cardiovascular Stress Tests	88.2	89.5	86.9	87.1	89.0	90.4	92.3	92.9
Other Tests – EKG Monitoring	84.0	75.7	80.8	64.8	87.1	79.4	93.7	91.2
Lab Tests – Automated General Profiles	46.6	48.3	36.5	23.0	100.0	99.8	20.1	6.4
Lab Tests – Blood Counts	77.5	78.8	79.3	73.0	79.1	79.8	66.1	42.3
Lab Tests – Bacterial Cultures	70.7	74.0	77.8	75.0	72.3	75.2	60.6	40.5
Total Unclassified	**80.7**	**96.2**	**57.0**	**84.4**	**91.5**	**92.0**	**34.5**	**81.7**
Total Immunizations	**94.5**	**95.2**	**92.5**	**92.3**	**94.1**	**95.3**	**98.0**	**98.7**
Total Other	**77.5**	**84.4**	**65.2**	**74.5**	**91.1**	**91.0**	**85.4**	**88.2**
Chiropractic	99.1	99.2	97.8	98.2			100.0	100.0
Vision, Hearing and Speech Services	89.2	92.0	96.1	94.9	90.6	88.3	94.5	98.4
Influenza Immunization	90.3	92.6	91.9	94.5	88.0	88.8	99.1	99.1
Ambulance	87.3	89.3	79.8	83.8	94.3	92.9	88.1	91.0
Chemotherapy	79.7	85.4	60.3	71.5	89.1	89.1	86.6	87.2
Other Drugs	69.9	78.9	59.9	70.8	89.0	91.5	80.6	83.7
Total Out-of-State	**14.0**	**12.5**	**15.9**	**14.6**	**10.5**	**10.4**	**8.7**	**9.8**

Migration out-of-state for services is expected to be greatest for residents living adjacent to an urban area in another state and for high risk procedures where patients are more inclined to travel for expert care. Payer business strategies may also play a role in determining out-of-state services as HMOs often contract with large providers that can offer substantial discounts based on patient volumes. Often these providers operate in several adjacent states.

The practice of contracting with multi-state providers helps explain some patterns within the major service categories by payer. Laboratory tests—Automated General Profiles—illustrate this phenomenon. Under Medicare non-HMO coverage, 100 percent of the payments for these tests are made to in-state practitioners while Medicare HMO FFS paid only 20.1 percent for these tests to in-state practitioners. Private payers kept their in-state payments below 50 percent for these specific lab tests with private HMO FFS having the lower in-state proportion of payments at 36.5 percent. Other service categories also have lower percentages that may reflect contracts with out-of-state businesses. The pattern of out-of-state payments by payer suggests substantial selective contracting in the private payer arena. Private HMO FFS payments are generally more likely to be directed out-of-state, probably due to more frequent selective contracting compared to private non-HMO payers.

Payments made to out-of-state businesses do not necessarily mean that patient care or lab services were received out-of-state. For example, more than 60 percent of private non-HMO payments for home visits went to out-of-state providers yet these services were likely performed in the patient's home. Some services a patient would likely travel out-of-state for include corneal transplants, cardiovascular procedures, radiation oncology, and certain imaging procedures.

Among the procedures listed above, a significant amount of corneal transplant payments go to out-of-state practitioners with the highest percent of out-of-state payments at 51 percent for private non-HMOs. The levels of out-of-state payments for this procedure vary substantially by payer. Similar variation also exists in oncology-radiation therapy services. For this service, about a quarter of payments for private recipients go out-of-state while only 8-13 percent of Medicare payments are out-of-state. Older beneficiaries are known to be less willing to travel to receive treatment due to complicating conditions and a greater hesitancy to leave home to obtain care.

Several cardiac procedures have out-of-state payment percents that are above average demonstrating the influence of prestigious cardiac care centers in the Washington DC area. For the Medicare non-HMO population, approximately one-third of coronary artery bypass graft (CABG) service payments and about 30 percent of related work RVUs are paid to out-of-state practitioners. In contrast, about 10 percent or less of Medicare payments and less than 10 percent of the associated RVUs are attributable to out-of-state practitioners for hip fracture repairs, hip replacements, and knee replacements. CABG is a major source of expenditures to out-of-state practitioners through Medicare. Coronary angioplasty and pacemaker insertions are also above average in out-of-state payments by Medicare non-HMOs. Although coronary procedures are less frequent for the under-65 privately insured population, they also

demonstrate above average out-of-state payment percents for CABG and pacemaker insertions.

For all payer categories, Evaluation and Management (E&M) services are paid to out-of-state practitioners in approximately the same proportion as are total services. This is also true for the proportion of work RVUs. Within the E&M category of services, however, two subcategories have relatively high proportions of out-of-state payments: emergency room visits and critical care visits in hospitals. About a third of emergency room payments for private recipients are paid to out-of-state practitioners and the percentage is just over 25 percent for Medicare FFS. In contrast, only 8.3 percent of the emergency room visit payments for Medicare non-HMO recipients go out-of-state, although this is above average for this payer. Hospital critical care visits also demonstrate above average out-of-state utilization for every payer. Critical care encompasses patients with central nervous system failure, circulatory failure, postoperative complications, or overwhelming infection.

Among imaging services, MRIs are associated with above average out-of-state payments and RVU percentages among private payers. For brain MRIs in particular, about one-fourth of HMO FFS payments and RVUs occur out-of-state. Heart imaging procedures also have above average out-of-state utilization for both private payers and Medicare non-HMO.

Out-of-State Resource Use by County and Payer

When Maryland residents receive care out-of-state, service is likely to occur close to the county where they live (data not shown). For example, 12.8 percent of private non-HMO and 21.1 percent of Medicare non-HMO services for recipients in Garrett County are provided in West Virginia, probably in Morgantown which has the closest tertiary hospitals to Garrett County. For Allegany County, 4.4 percent of private non-HMO services and 7.4 percent of Medicare non-HMO services are provided in West Virginia. While Allegany County borders a rural portion of West Virginia, patients would have to travel through Garrett County to get to Morgantown thereby supporting the lower migration rate.

As might be expected, high levels of migration for services takes place from the counties bordering Washington DC, especially for private non-HMO services. For Montgomery County residents, 15.2 percent of services for private non-HMO recipients, 9.3 percent of services to private HMO FFS recipients, 10.4 percent of services to Medicare non-HMO recipients, and 5.1 percent of services to Medicare HMO FFS recipients are provided in Washington DC. From Prince George's County, the proportion of services provided in Washington DC is even higher: 19.2 percent for private non-HMO, 16.0 percent for private HMO FFS, 10.6 percent for Medicare non-HMO, and 6.0 percent for Medicare HMO FFS. Migration is not absolutely related to proximity to Washington DC as rates drop significantly in counties that are slightly further from the District. For example, from Charles County, the proportion of services provided in Washington DC ranges from 3.5 percent to 5.4 percent for various payers, and from Calvert County, the range is only 2.4 percent to 4.0 percent.

Cecil County residents make significant use of practitioners in the adjacent state of Delaware. Cecil County is part of the Wilmington, Delaware Primary Metropolitan Statistical Area (PMSA) and many county residents work in Delaware. Migration is substantial with 33.1 percent of private HMO FFS services, 12.8 percent of private non-HMO services, 22.8 percent of Medicare non-HMO services, and 11.6 percent of Medicare HMO FFS services provided in Delaware. These are the highest out-migration percentages for HMO FFS and Medicare non-HMO services. Wilmington also provides tertiary care hospitals to Cecil County residents, which explains the high level of out-of-state migration for Medicare residents.

Out-of-state migration to Pennsylvania is highest for Harford County, with 5.5 percent of private non-HMO and 9.1 percent of private HMO FFS services provided in that state. One surprising feature of services provided in Pennsylvania is the services provided to residents of relatively distant counties. Examples are Charles, Calvert, and St. Mary's counties, which have 4 to 6 percent services provided in Pennsylvania for either private or public payers. There is also some migration for services to Pennsylvania from Montgomery, Prince George's, and Baltimore counties, and Baltimore City.

Service Intensity per Recipient by Region and Payer

Table 21 shows how the mean service intensity (i.e., work RVUs per service) for the average recipient varies by region and payer for Maryland residents. As with the average intensity per service (refer to Table 4, Chapter 2), service intensity per patient is greater in HMO FFS recipients than in non-HMO patients. In fact, the non-HMOs have per patient service intensities almost 25 percent lower than the HMOs due to the specialized nature of the HMO FFS services. HMO FFS recipients also have more regional variation in this measure than do non-HMO recipients. In private HMO FFS, per recipient service intensity ranges from 5 percent above the payer average to 10 percent below average. Variation is somewhat greater in Medicare HMO FFS ranging from 10 percent above the payer average to 11 percent below. The greater variation in per recipient service intensity for HMOs may reflect regional differences in the types of services that HMOs reimburse using FFS. In rural areas, HMOs may have to reimburse on a FFS basis services that are normally capitated in urbanized areas, consequently per recipient service intensity in rural areas is lower. Differences among HMOs in their use of FFS reimbursement and the tendency of most HMOs to operate in particular market regions of the state also contribute to regional variations in this measure for HMO FFS recipients.

Per recipient service intensity is greatest in the National Capital Area (NCA) for private non-HMO payers as well as HMO FFS payers, with HMO FFS service intensity per average resident nearing or exceeding the 1.0 mark. In HMO FFS this could result simply from the HMOs that operate in the NCA using FFS reimbursement mainly for more complex services. But this measure is also highest in the NCA under private non-HMOs, which raises the possibility that the practice style of physicians in this region may be relatively more service intensive. Patient demand for higher resource services may also play a role in this region. Aside from higher resource intensity in NCA, no clear pattern exists among the other regions in terms of this measure across payer categories.

TABLE 21
SERVICE INTENSITY PER RECIPIENT BY REGION AND PAYER - 1998[4]

REGION	MEAN WORK RVUS PER SERVICE PER RECIPIENT			
	Private Non-HMO	Private HMO FFS	Medicare Non-HMO	Medicare HMO FFS
National Capital Area	0.74	0.98	0.72	1.02
Baltimore Metro Area	0.73	0.91	0.77	0.91
Eastern Shore	0.72	0.89	0.77	0.83
Southern MD	0.72	0.84	0.74	0.93
Western MD	0.70	0.93	0.71	0.87
TOTAL	**0.72**	**0.93**	**0.75**	**0.93**

Variations in Mean Utilization per Recipient by Region and Payer

Table 22 presents how per recipient mean total payments and total work RVUs are allocated across the major BETOS categories by region of Maryland and payer type.

Private Non-HMO

Non-HMO recipients exhibit substantial differences in their average number of services, payment, and number of work RVUs across the regions. The variation in mean total payments across the regions is considerable with a 36 percent difference between the lowest non-HMO payment for patients living on the Eastern Shore and the highest payment for patients living in the NCA. The NCA consistently carries the highest mean payment and RVUs for the majority of service categories. The greatest regional variation in average payment and RVUs for private non-HMO recipients occurs in the Evaluation and Management (E&M), tests, and other service categories. Mean payment per recipient for E&M services varies from $412 for the NCA, where total payment is the highest, to $238 on the Eastern Shore, where total payment is lowest, a difference of 42.2 percent. The mean work RVUs per recipient for E&M varies 35.6 percent from 6.01 in the NCA Capital Area to 3.87 on the Eastern Shore.

[4] Mean service intensity for the average recipient tends to be smaller than the payer's mean service intensity (Table 4). This difference is greater in Medicare recipients because significant numbers of Medicare patients use more health care services than the average Medicare recipient. The highly complex services received by these patients result in the payer's mean service intensity being 8 and 11 percent greater than the intensity of services received by the average non-HMO and HMO FFS recipient, respectively.

TABLE 22
ALLOCATION OF MEAN TOTAL PAYMENT AND WORK RVUs PER RECIPIENT BY SERVICE CATEGORY, REGION, AND PAYER - 1998

Payer Type and Specialty Category	Maryland		National Capital Area		Baltimore Metro Area		Western MD		Southern MD		Eastern Shore	
	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs
PRIVATE NON-HMO	**$783**	**9.88**	**$1,015**	**11.61**	**$716**	**9.60**	**$702**	**8.65**	**$671**	**8.66**	**$655**	**8.34**
Evaluation & Management	299	4.82	412	6.01	268	4.59	245	3.96	249	4.16	238	3.87
Procedures	283	3.16	327	3.42	271	3.15	269	2.94	239	2.73	265	2.98
Imaging	95	0.61	124	0.65	84	0.60	93	0.61	91	0.59	78	0.58
Tests	74	0.95	103	1.14	66	0.92	69	0.84	67	0.89	51	0.64
Unclassified	7	0.06	8	0.04	5	0.07	11	0.12	4	0.05	5	0.04
Childhood Immunizations	6	0.08	7	0.08	6	0.08	4	0.06	6	0.08	4	0.07
Other	20	0.20	34	0.27	16	0.20	11	0.11	14	0.15	14	0.15
PRIVATE HMO-FFS	**571**	**7.63**	**637**	**8.32**	**519**	**7.02**	**545**	**7.79**	**548**	**7.26**	**546**	**7.32**
Evaluation & Management	213	3.56	253	4.07	190	3.24	167	3.16	209	3.32	181	3.12
Procedures	229	2.89	253	3.14	202	2.59	254	3.32	204	2.75	233	2.89
Imaging	63	0.43	65	0.40	59	0.41	62	0.52	71	0.45	77	0.68
Tests	36	0.44	35	0.39	38	0.49	39	0.49	36	0.46	29	0.31
Unclassified	4	0.01	4	0.01	3	0.01	2	0.01	5	0.01	1	0.01
Childhood Immunizations	6	0.09	6	0.10	5	0.08	6	0.10	5	0.10	5	0.10
Other	20	0.20	20	0.21	22	0.21	16	0.19	18	0.17	19	0.20
MEDICARE NON-HMO	**1,922**	**28.23**	**2,226**	**30.95**	**1,921**	**28.49**	**1,559**	**24.39**	**1,977**	**29.19**	**1,494**	**23.42**
Evaluation & Management	784	13.86	922	15.68	772	13.73	648	12.00	792	14.64	624	11.43
Procedures	581	8.18	631	8.24	592	8.53	493	7.15	601	8.35	476	7.18
Imaging	250	2.11	314	2.13	242	2.16	195	2.02	294	2.37	163	1.80
Tests	148	2.22	188	2.82	146	2.16	116	1.91	147	2.22	88	1.33
Unclassified	2	0.03	1	0.02	2	0.03	2	0.03	1	0.02	1	0.02
Childhood Immunizations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Other	159	1.83	169	2.05	169	1.87	105	1.28	141	1.59	142	1.66
MEDICARE HMO-FFS	**1,179**	**15.07**	**1,207**	**15.86**	**1,199**	**14.80**	**1,025**	**14.67**	**1,335**	**16.71**	**1,021**	**14.31**
Evaluation & Management	338	6.32	365	6.54	330	6.24	300	5.90	413	6.86	319	6.39
Procedures	507	5.69	493	6.48	537	5.40	426	5.66	494	6.66	415	5.03
Imaging	156	1.10	156	0.94	154	1.10	148	1.29	204	1.19	151	1.43
Tests	69	0.81	69	0.61	69	0.89	75	0.98	81	0.75	59	0.68
Unclassified	9	0.01	19	0.02	5	0.02	1	0.00	40	0.00	1	0.01
Childhood Immunizations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Other	100	1.13	105	1.26	105	1.16	74	0.84	103	1.25	76	0.77

Comparisons of the service mix within each region indicate that the NCA has the highest proportions of payment and RVUs devoted to E&M relative to other regions. On the other hand, this same region has the lowest concentrations of payment and RVUs in procedures. The high mean payment and RVUs for NCA recipients result not from the broad service mix but from a high service volume allocated to highly intensive services in most service categories, coupled with high per RVU reimbursement. NCA's average payment per RVU is the highest of any region, regardless of service category. And the

intensity of E&M, procedures, imaging and other services in the NCA are also higher than in any other region. As noted in Table 21, the intensity of practitioner services received by the average recipient is highest in the NCA for all of the payer types except Medicare non-HMO.

Private HMO FFS

HMO FFS recipients are associated with lower payments and fewer work RVUs than the non-HMO recipients in every region reflecting the absence of capitated HMO services in this analysis. The private HMO FFS services demonstrate much less variation in utilization among the regions than do the private non-HMO services. Payments per recipient range from a low of $519 in the Baltimore Metro Area to $637 in the NCA, a difference of nearly 19 percent. Work RVUs vary 16 percent from a high of 8.32 in the NCA to a low of 7.02 in the Baltimore Metro Area. Although the Eastern Shore does not have the lowest RVU per recipient as in private non-HMOs, the private payers are consistent in having the highest payments and RVUs in NCA residents and the lowest payments for residents on the Eastern Shore.

The regional distributions of private HMO FFS RVUs and payments among the service categories have some similarities to those for private non-HMO but also some differences. For both types of payers, the regions of Western Maryland and the Eastern Shore show the highest shares allocated to procedures and the lowest shares allocated to E&M. The NCA has the highest percentages assigned to E&M. However, among the HMO FFS services, the lowest shares for procedures occur in Southern Maryland (payments) and the Baltimore Metro Area (work RVUs). Another difference from the private non-HMO payers is that imaging services show appreciable variation across regions in their shares of payments and RVUs. As in non-HMO services, payment per RVU for E&M, procedures, and imaging is highest in the NCA. However, service intensity is only highest in the NCA for E&M services, with Southern Maryland residents averaging the most complex procedures, Baltimore residents the most intense imaging services, and Western Maryland residents the most complex other services.

Medicare Non-HMO

Medicare non-HMO recipients also exhibit substantial variation from region-to-region in per recipient utilization. As in private non-HMOs, the NCA has the highest overall payment and RVU utilization and the Eastern Shore has the lowest. This pattern persists across the major service categories for payment. The percent between the lowest, $1,494, and highest, $2,226, average payment is 33 percent. Work RVUs range from 30.95 to 23.42, a 24 percent difference. Tests exhibit the largest service-specific variation: 53 percent in payment and in RVUs.

The Medicare service mix patterns are not as consistent as in the private payers. Although the NCA once again has the lowest share of payments and RVUs allocated to procedures, and ranks first in the E&M share of RVUs, Western Maryland and the Eastern Shore have the largest payment shares allocated to E&M. These more rural regions also have the largest payment and RVU shares for procedures. Service intensity for the average Medicare non-HMO patient is greatest in the Baltimore Metro Area and

on the Eastern Shore (Table 21), but in terms of service categories, recipients in the NCA receive the most intensive E&M services and the least intensive procedures. Conversely, residents on the Eastern Shore receive the most complex procedures but the least intensive E&M services.

Medicare HMO FFS

In Medicare HMO FFS services, regional variation in total payments per recipient is almost 24 percent - - less than in Medicare non-HMO but greater than in private HMO FFS. As it has been for the other payers, total payment per recipient is highest in Southern Maryland at $1, 335 per recipient and lowest on the Eastern Shore and Western Maryland at $1,021 and $1,025, respectively. The same pattern emerges when work RVUs are considered: the range extends from a low of 14.31 on the Eastern Shore to a high of 16.71 in Southern Maryland. This 14 percent work RVU difference is the smallest RVU variation among the payers.

The service mix in Medicare HMO FFS is different from that observed among the other payers in that the mix for the NCA tends to be more average. As in Medicare non-HMO services, the highest shares of payment allocated to E&M occur for residents on the Eastern Shore, who also rank first in the RVU share for E&M. The Baltimore Metro Area beneficiaries have the highest payment share allocated to procedures and the lowest payment shares for E&M. Residents of the NCA, who average the most complex care per average recipient (Table 22), receive the most intensive E&M and other services. Residents of Southern Maryland tend to receive the most complex procedures and imaging services. Payment per RVU is highest in the NCA for most of the service categories.

Utilization by Specialty, Geographic Region, and Payer

Table 23 provides information on how per recipient mean total payment and total work RVUs are allocated to the major practitioner specialty categories by region and payer. Utilization information for the individual specialties is provided in Appendix F. The values presented in Table 23 indicate how much of the average payment and number of RVUs per recipient is accounted for by each of the specialties, and when summed together equal the average payment and number of RVUs listed in the top row. The statewide mean total payment and work RVUs reported in Table 23 are different from the values in Table 22 as explained in the introduction.

Private Non-HMO

Because private non-HMO mean payment per recipient is highest in the NCA, this region will tend to have the highest mean payment for most of the specialties. The only exceptions are family practice and providers coded as freestanding clinics in family practice, chiropractors, and the other providers category (Appendix F). Family practice physicians receive their lowest shares of total payments and work RVUs in the NCA. Conversely, they receive their highest shares for residents of Western Maryland, which results in this region having the highest average payment for this specialty at $58. Similarly, chiropractors account for less payments and RVUs in the NCA than in any

other region. The regional variations in mean payment and work RVUs per specialty is greater for specialty care physicians than for primary care, and lowest for non-physician health care professionals.

TABLE 23
ALLOCATION OF MEAN TOTAL PAYMENT AND WORK RVUs PER RECIPIENT TO THE MAJOR SPECIALTY CATEGORIES BY REGION, AND PAYER - 1998

Payer Type and Specialty Category	Maryland		National Capital Area		Baltimore Metro Area		Western MD		Southern MD		Eastern Shore	
	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs	Paymt.	Work RVUs
PRIVATE NON-HMO	**$818**	**9.85**	**$1,080**	**11.56**	**$726**	**9.58**	**$803**	**8.59**	**$700**	**8.64**	**$694**	**8.29**
Primary Care Physicians	215	2.76	275	3.18	190	2.66	229	2.59	220	2.99	159	2.05
Specialty Care Physicians	340	4.15	488	5.56	298	3.84	288	3.40	270	3.27	253	3.15
Physicians Without a Specialty Identified	41	0.35	100	0.82	18	0.16	29	0.24	22	0.21	38	0.33
Non-Physician Health Care Professional	91	1.30	99	1.25	93	1.43	72	0.94	82	1.13	70	1.03
Other Providers	131	1.29	118	0.76	126	1.49	185	1.42	106	1.04	174	1.73
PRIVATE HMO FFS	**581**	**7.61**	**651**	**8.29**	**523**	**7.00**	**566**	**7.79**	**567**	**7.24**	**551**	**7.32**
Primary Care Physicians	106	1.47	124	1.66	94	1.37	68	0.96	152	1.99	78	1.10
Specialty Care Physicians	343	4.50	383	4.89	303	4.03	340	4.93	308	3.97	393	5.11
Physicians Without a Specialty Identified	44	0.51	50	0.60	46	0.53	23	0.25	43	0.55	15	0.17
Non-Physician Health Care Professional	45	0.70	48	0.77	42	0.61	54	0.97	34	0.45	40	0.68
Other Providers	**44**	**0.42**	**45**	**0.37**	**39**	**0.47**	**81**	**0.68**	**30**	**0.28**	**26**	**0.25**
MEDICARE NON-HMO	**1,922**	**28.23**	**2,226**	**30.95**	**1,921**	**28.49**	**1,559**	**24.39**	**1,977**	**29.19**	**1,494**	**23.41**
Primary Care Physicians	364	6.15	355	5.58	384	6.54	346	6.16	380	6.81	301	5.34
Specialty Care Physicians	1,322	18.45	1,620	21.27	1,285	18.22	1,035	15.35	1,394	19.39	1,009	15.12
Physicians Without a Specialty Identified	11	0.20	24	0.41	8	0.14	3	0.06	13	0.23	2	0.04
Non-Physician Health Care Professional	81	1.43	99	1.70	81	1.44	63	1.08	76	1.16	59	1.15
Other Providers	143	2.00	128	1.98	163	2.15	112	1.75	114	1.60	122	1.76
MEDICARE HMO FFS	**1,187**	**15.04**	**1,213**	**15.85**	**1,207**	**14.76**	**1,031**	**14.65**	**1,340**	**16.70**	**1,033**	**14.31**
Primary Care Physicians	135	2.09	139	1.83	135	2.18	108	1.75	159	2.23	140	2.45
Specialty Care Physicians	624	8.96	674	9.62	599	8.54	664	9.88	749	9.51	564	9.02
Physicians Without a Specialty Identified	132	1.76	203	2.58	113	1.55	54	0.88	253	3.48	76	0.99
Non-Physician Health Care Professional	78	0.89	73	0.86	85	0.97	65	0.74	69	0.62	59	0.65
Other Providers	218	1.33	124	0.96	276	1.52	140	1.40	110	0.87	194	1.20

The mix of specialties that deliver practitioner services in each region differs in some basic ways. Specialists deliver the largest share of practitioner services in the NCA, accounting for nearly one-half of all practitioner work RVUs (Appendix F). The other regions are all more similar in the RVU contribution made by specialists, ranging from 38 percent of the total on the Eastern Shore to 41 percent in the Baltimore Metro Area. The greatest share of total RVUs delivered by primary care physicians, 35 percent, occurs in residents of Southern Maryland, while the lowest share occurs on the Eastern Shore, 25 percent. The other regions are more similar with the primary care RVU share being 28 –30 percent of the total. However, the low share on the Eastern Shore may be

an artifact of a lack of specialty coding for the practitioners treating these residents. About 11 percent of the RVUs delivered to residents of this area did not have a specialty code, more than twice the rate of the next highest area. The greatest contribution made by non-physician health professionals, 15 percent of total RVUs, occurs in the Baltimore Metro Area. This percentage is undoubtedly related to the greater availability of non-physician health professionals in the Baltimore Metro Area. Nearly one-third of Baltimore's non-physician RVUs are delivered by chiropractors and almost one-quarter are delivered by physical therapists.

Private HMO FFS

As with every other payer, the mean private HMO FFS payment is highest in the NCA, resulting in this region having the highest average payment for each specialty. However, the mean payments to non-physician health care professionals and other providers are highest in Western Maryland, as shown in Table 23. And the mean payment to primary care physicians, specifically the specialties of internal medicine and pediatrics (Appendix F), is highest in Southern Maryland. Unlike the private non-HMO services, regional variation in these HMO FFS services is smallest for mean payments to specialty care physicians, followed by non-physician health care professionals, with variation in primary care mean payments more than twice that of specialty care.

Care delivered by physician specialists dominates the HMO FFS services (Appendix F). It is most prevalent on the Eastern Shore where 70 percent of total FFS work RVUs are delivered by specialty care physicians. The specialty care percentages in the other regions are more similar, ranging from 54 to 60 percent of total RVUs. Radiology especially contributes to the larger specialty care percentage of the Eastern Shore's FFS services. The share of total FFS RVUs delivered by primary care physicians ranges from nearly 28 percent in Southern Maryland to 12 percent in Western Maryland, the area for which the non-physician health care share is highest.

Medicare Non-HMO

NCA has the highest mean total payment per recipient, but unlike private non-HMO services, the Medicare non-HMO mean payments are not always highest in NCA. The region's residents rank highest in the mean payments to specialty care physicians and non-physician health care professionals. However, the Baltimore Metro Area has the highest mean payments to primary care physicians – driven by payments to internal medicine physicians – and to other providers. The lowest mean payments in all specialty categories but other providers are associated with residents of Eastern Shore. Another difference relative to the private non-HMO data is that the regional variation in primary care mean payments is smaller than the variation in total payments, and the greatest payment variability occurs for non-physician health care professionals (excluding physicians of unidentified specialty).

Variation in the mix of specialties across the regions also differs from the private non-HMO services (Appendix F). Although specialty care physicians account for the largest share of work RVUs in NCA (69 percent), it is not much different from the specialty care shares in the other regions which range from 63 to 67 percent, unlike the

private data. The primary care contribution to total work RVUs is nearly the same – 23-25 percent – for all regions except the NCA, with 18 percent. The contribution to RVUs by non-physician health professionals is also more similar across the regions than in private non-HMO insurance, ranging from about 4 to 5 percent.

Medicare HMO FFS

Within Medicare HMO FFS, residents of Southern Maryland have the highest mean payment overall and for primary and specialty care physicians services. Baltimore, however, has the highest mean payments allocated to non-physician health care professionals and other providers, as shown in Table 23. As in the private HMO FFS services, regional variation in mean payments is smallest for specialty care, but variation in primary care payments is only about 1.3 times that of primary care, with variation in non-physician health professional mean payments slightly less than for primary care.

As in private HMO FFS services, care delivered by physician specialists dominates the Medicare HMO FFS (Appendix F). It is most prevalent in Western Maryland (unlike private HMO FFS) where 67 percent of total FFS work RVUs are delivered by specialty care physicians. The specialty care percentages in the other regions range from 57 to 63 percent of total RVUs. The share of total FFS RVUs delivered by primary care physicians ranges from 17 percent on the Eastern Shore to just under 12 percent in the NCA and Western Maryland regions. Southern Maryland residents receive the smallest share, under 4 percent, of their RVUs from non-physician health care professionals and Baltimore residents receive the largest, nearly 7 percent.

Conclusions

As a whole, Maryland residents are more likely to cross borders for specialty care than for routine services. ***The services with the highest rates of out-of-state utilization are specialized procedures, including corneal transplants, cardiovascular procedures such as CABG, radiation oncology, and imaging procedures such as MRIs.*** Emergency services also have above-average out-of-state utilization rates due to the unpredictable need for this type of care. On average, Maryland residents' utilization of out-of-state practitioner services ranges from about 15 percent of the private HMO FFS work RVUs to 10 percent of Medicare non-HMO work RVUs. Among the payers, out-of-state utilization is higher in private patients than in elderly Medicare recipients, who are reluctant to travel for care. Among the private patients, border crossing for services tends to be slightly higher for HMO FFS service than in non-HMO services. The possible reasons for this include: the specialized nature of the HMO FFS services which increases the likelihood of border crossing to tertiary care hospitals or providers of renown; location of HMO markets, which are more concentrated in urban areas that encompass three of the counties with the highest rates of border crossing; and contractual arrangements by HMOs which send patients, or perhaps just the dollars, across the border.

Maryland residents who live in counties that border Delaware, Washington DC, and West Virginia are the most likely to receive insured practitioner services outside of Maryland. Border crossing by elderly patients is related to the nearest location of both tertiary care hospitals and specialty care. Border crossing in privately insured patients is mostly related to commuting patterns, as well as the nearest location for specialty care. HMO FFS services border crossing is highest for residents of Cecil County, with one-third of private HMO FFS and about 12 percent of Medicare HMO FFS services received in Delaware. Cecil is part of the Wilmington, Delaware PSMA. Receipt of services in Delaware is also frequent for Medicare non-HMO beneficiaries living in Cecil County who receive 23 percent of their practitioner services there. Border crossing is nearly as common for Medicare non-HMO beneficiaries living in Garret County with 21 percent of their services provided in West Virginia where Morgantown is the nearest city. Obtaining services in Washington DC is most common for those covered by private non-HMO insurance who live in Prince George's and Montgomery counties, with 19 and 13 percent of their services rendered in the District, respectively.

Comparisons of practitioner service utilization exhibit considerable regional variation in the average payment, work RVUs, and number of services per recipient. Regional variation in utilization is greater for the non-HMO services than for the HMO FFS services. Although there are no consistent patterns across the four payer types, utilization by residents of the NCA tends to be greater than in the other regions. Except for Medicare non-HMO beneficiaries, the average NCA resident uses more complex services than their counterparts in the other regions. For all payers except Medicare HMO FFS, they average the highest mean payments and number of work RVUs per recipient. This ranking tends to persist regardless of the category of service or the type of specialty delivering the service. The higher utilization measures for the NCA result not so much from the categories of services delivered, but from receiving more intensive services within most of the categories. Additionally, the average payment per RVU tends to be higher in the NCA than in any other region.